Claims

1. A method for forming protected routes, each route comprising two separate paths in a communications network, which network comprises several functional layers on top of one another, each layer forming demands for protected routes in the layers below, c h a r a c t e r i z e d in that the forming comprises:

routing the layers from bottom to up in a way that the layer under formation is routed into the layer below the layer under formation, starting from the layer above the bottom layer, and finishing when the top layer is routed into the layer below the top layer, each routing in turn taking into account the protection demands, and taking into account the routing possibilities in the layer below.

2. A method according to claim 1, c h a r a c t e r i z e d in that after each routing of the layer under formation, the routings of the layers below are changed, if needed, in a way that the first below layer is routed first again, and the second below layer second, and so on until there is no need to route again.

3. A method according to claim 1, c h a r a c t e r i z e d in that after each routing of the layer under formation, the routings of the layers below are changed, if needed.

4. A method according to claim 1, 2 or 3, c h a r a c t e r i z e d in that the taking of the demands into account comprises taking into account the demands from the layer under formation and from the layers above the layer under formation.

5. A method according to claim 1, 2, 3 or 4, c h a r a c t e r i z e d in that the routing under formation comprises the step of:

a: finding the two shortest routes from the all route candidates, each route formed by transmission lines one after the other, each transmission line having a weight describing the length of the transmission line, and all transmission lines to marked as unprotected, reliable, or protected,

b: fixing one of the found routes,

c: calculating new weights for the transmission lines which are common to both the found routes by adding a penalty weight to the weights of the common transmission lines,

d: finding a new shortest route for the route which is not fixed,

e: repeating c and d phases until the last route found is no better than the route found before.

6. A method according to claim 4, c h a r a c t e r i z e d in that taking into account the routing possibilities in the layer below comprises forming a sublayer which describes possibilities for protected routes, the forming comprising the steps of:

taking all nodes from the layer below the layer under formation into the sublayer,

taking reliable and protected transmission lines from the layer below the layer under formation into the sublayer,

forming a new transmission line between each pair of the nodes where can be found two separate routes in the layer below the layer under formation,

using the sublayer when routing the layer under formation in a way that the sublayer represents the layer below the layer under formation.

7. A method according to claim 2 or 3, c h a r a c t e r i z e d in that the taking of the demands into account comprises taking into account the demands from the layer under formation and from the layers above the layer under formation, and changing the routing under formation comprises the step of:

a: fixing all existing routes except the route which is desired to change,

b: calculating, for the transmission lines, which are desired to keep separate from the transmission line whose route is desired to change, each transmission line having a weight describing the length of the transmission line, new weights, by adding a penalty weight to the weights of the trans-mission lines, which are desired to keep separate,

c: finding a new shortest route for the link whose route is not fixed,

d: repeating a, b and c phases until the last route found is no better than the route found before.